



Serial No. 10/621,129
67,008-070
S-5668

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: **Yuriy Gmirya**

Group Art Unit: **3681**

Serial No.: **10/621,129**

Examiner: **Le, David D.**

Filed: **July 16, 2003**

Title: ***SPLIT-TORQUE GEAR BOX***

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER RULE 1.131

I, **YURIY GMIRYA**, state as follows:

- 1) I have reviewed the above-referenced application and the documents associated with the filing and prosecution thereof.
- 2) I am the inventor in the above-referenced application; I am employee of Sikorsky Aircraft Corporation, of 6900 Main Street, P.O. Box 9729, Stratford, CT 06615-9129; and I am subject to assignment of the above-referenced application thereto.
- 3) I have assigned my entire interest in the above-referenced application to Sikorsky Aircraft Corporation, of 6900 Main Street, P.O. Box 9729, Stratford, CT 06615-9129.
- 4) The invention disclosure was prepared by me on a date before the effective 35 U.S.C. 102(e) date of 2004/0237684 *al* to *Bossler*, which claims the date of provisional application No. 60/473,858 which is May 28, 2003. Exhibit A attached to this Declaration is a copy of an invention disclosure document that was completed prior to May 28, 2003. The signature page is page 1 of the document, and I have signed the disclosure not only in the signature block but also adjacent the figures. Two persons have also witnessed my signature and understood the inventive concept at that time. Dates on the signature pages and the dates on the drawings included in the disclosure form have been redacted, but I have looked at these dates and all of the dates are prior to May 28, 2003.

- 5) I was informed of the decision made to prepare and file a patent application by Sikorsky Aircraft Corporation. Diligence was maintained throughout the preparation and filing of the application. The subject application was filed on July 16, 2003.
- 6) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: April 13, 2005

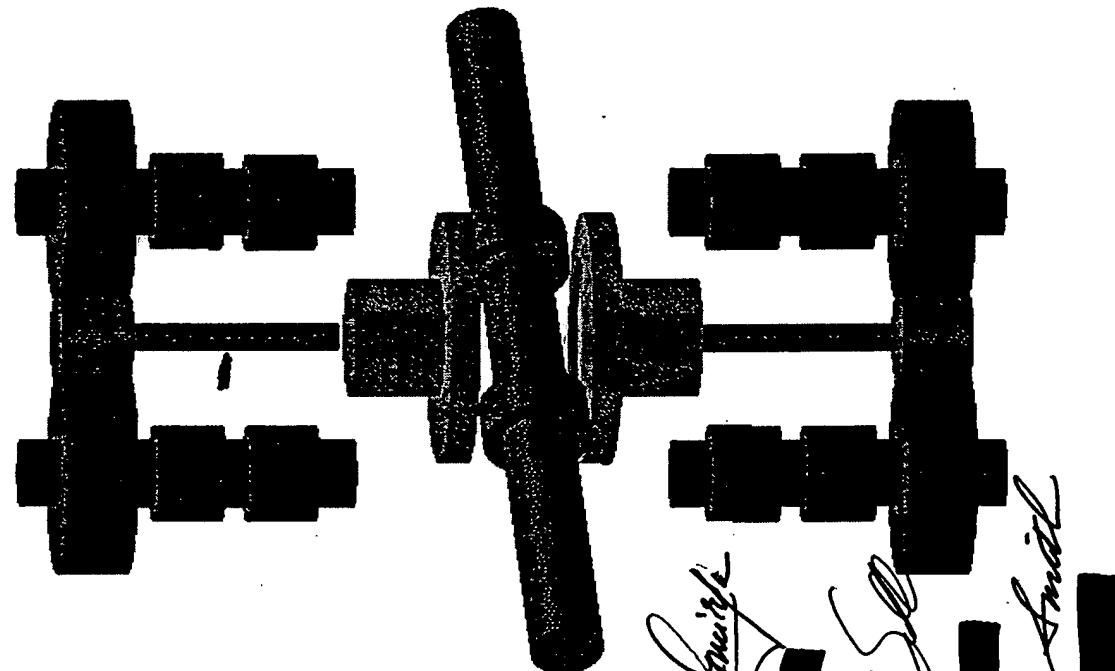


Yuriy Gmirya

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APR 18 2005
U.S. PATENT & TRADEMARK OFFICE
Sikorsky
A United Technologies Company
CH-53X POWER TRAIN MODIFICATION

Split Module



INVENTOR: *Henry Pringle*

WITNESSED: *Mark S. Seel*

John Smith

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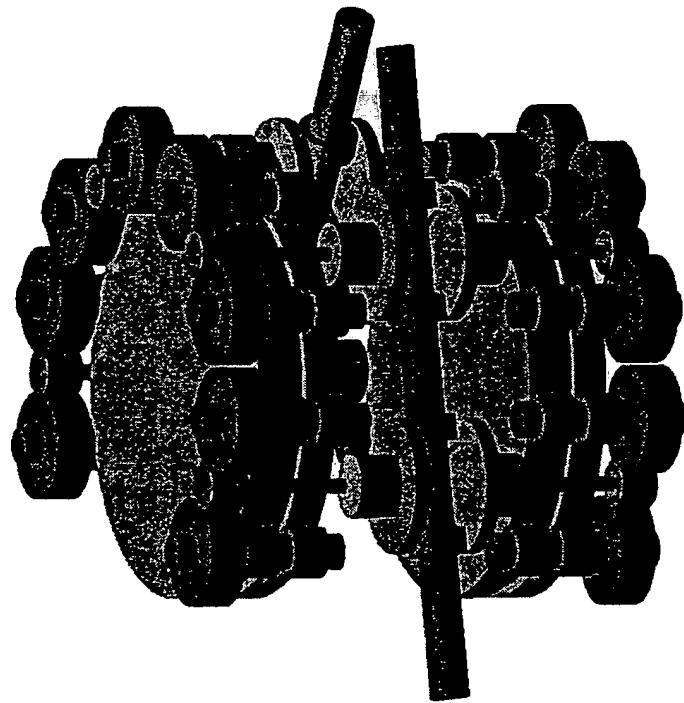
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CH-53X POWER TRAIN MODIFICATION

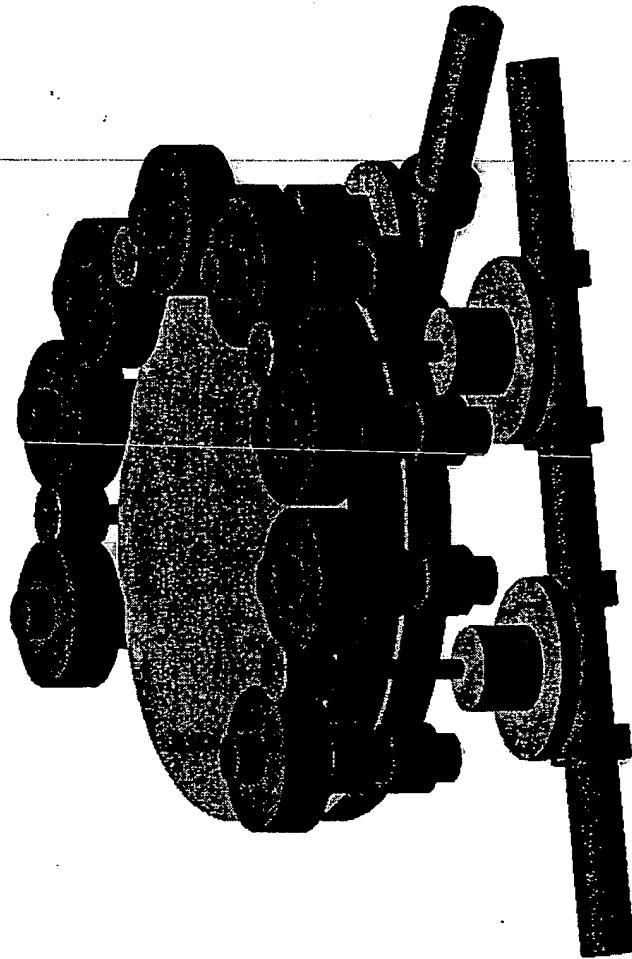
Split Torque Main Gearbox



32 points contact

INVENTOR: *John G. Gable* [Signature]
WITNESSED: *Mike W. Sasse* [Signature]

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16 points contact

INVENTOR: [Signature]
WITNESSED: [Signature]

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CH-53X POWER TRAIN MODIFICATION

Parts Quantity

Planetary MGB			Split Torque MGB (32)			Split Torque MGB (32)		
Stage	Gears	Bearings	Gear Shafts	Bearings	Gear Shafts	Gear Shafts	Bearings	Gear Shafts
First	4	14	12	24				
Second	8	12	24	32				
Third	15	26	2					
Total	27	52	38					

Parts

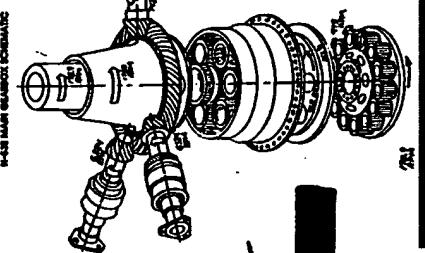
8 7

Two Carriers

4410

INVENTOR:

John Griswold



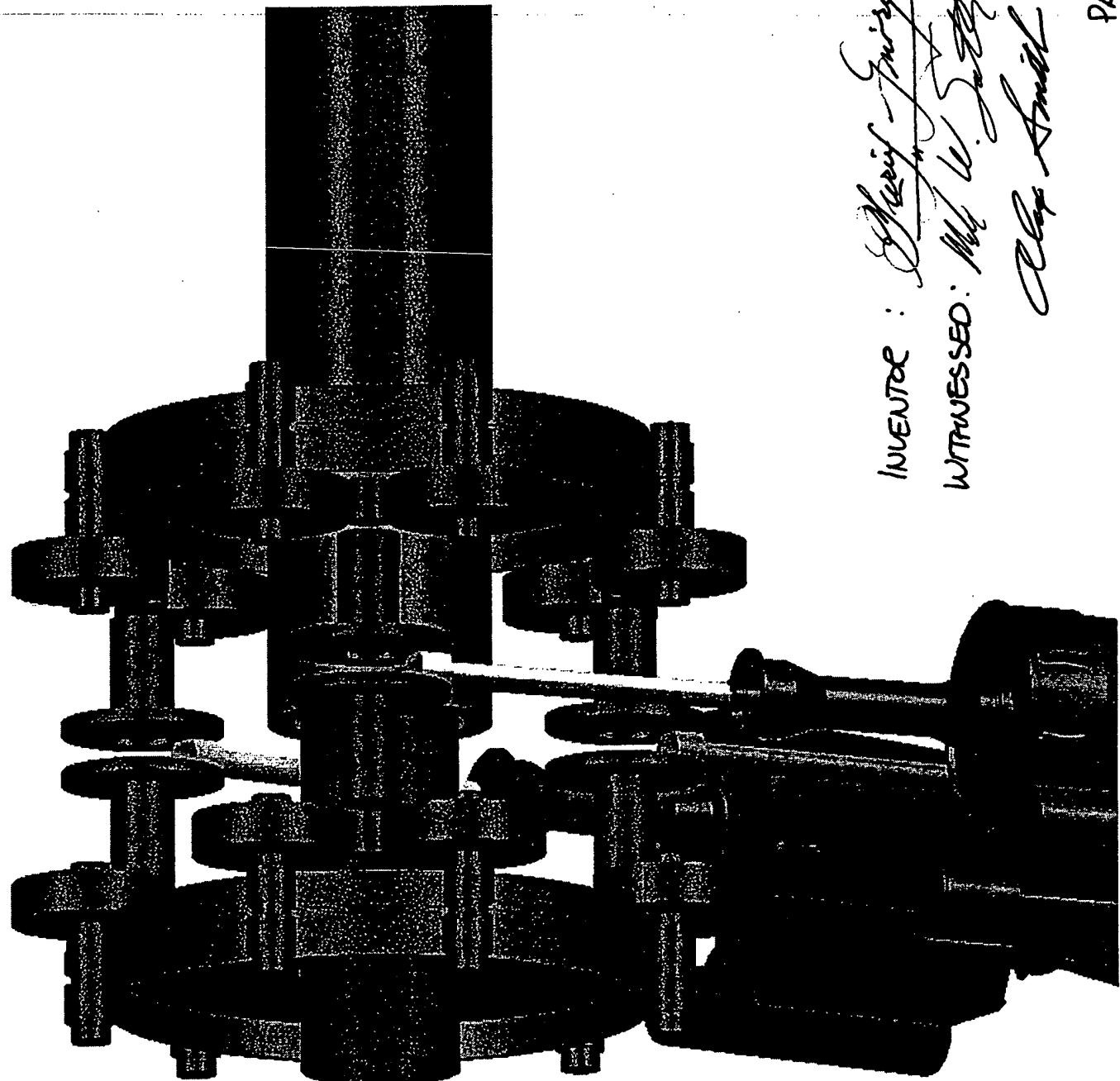
WITNESSED:

Mr. W. Saito

John Griswold

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COAXIAL POWER TRAIN



INVENTOR: Henry S. Smith
WITNESSED: W. W. Soddy
John Smith

SPLIT TORQUE GEARBOX

Split Torque Gearbox Design

The proposed Split Torque Gearbox is a multiple path, three stages power gear train that transmits torque from a high-speed engine to a low speed output shaft, providing equal gear load distribution due to floating pinion in the second stage of reduction. The gearbox is primarily designed for a single rotor application, but can be easily transformed into dual rotor (coaxial) design.

The major component of the gearbox is a Split Module. The number of the Split Modules in the gearbox depends on aircraft configuration, number of engines and transmitted power. These modules are located around a last stage output gear that combines power from each one and transmits it to the main rotor. The floating pinion, which is a part of the second stage of reduction, provides equal load balance between all gears engaged in the power train.

The Split Torque Gearbox consists of the following stages:

- The first stage – Face Gears or Spiral Bevel Mesh.
- The Second Stage – Spur Gears.
- The third Stage – Double Helical Mesh.

The Split Torque Gearbox brings the following advantages:

- weight reduction,
- flexible design (single/dual rotor),
- fewer number of parts,
- low risk conventional gears,
- increase in reliability of the drive system due to redundant load path,
- reduction in production cost.